U.S. Department of Energy
Office of River Protection
P.O. Box 450
Richland, Washington 99352

02-OSR-0437

Mr. R. F. Naventi, Project Manager
Bechtel National, Inc.
3000 George Washington Way
Richland, Washington 99352

Dear Mr. Naventi:

CONTRACT NO. DE-AC27-01RV14136 – APPROVAL OF BECHTEL NATIONAL, INC. (BNI) AUTHORIZATION BASIS CHANGE NOTICE (ABCN) 24590-WTP-ABCN-ESH-02-018, REVISION 0

Reference: BNI letter from A. R. Veirup to M. K. Barrett, ORP, "Transmittal for Approval – Authorization Basis Change Notice 24590-WTP-ABCN-ESH-02-018, Revision 0, 'Fabrication and Installation Standards for Embedded C5 Ductwork'," CCN: 036707, dated August 6, 2002.

The U. S. Department of Energy, Office of River Protection has reviewed the ABCN submitted in the Reference letter. The proposed changes to the Safety Requirements Document, to add a fabrication and installation standard for embedded C5 ductwork to allow the use of pipe material as ductwork, are acceptable.

There is reasonable assurance that the authorization basis changes do not adversely affect the health and safety of the public or workers, are consistent with applicable laws, regulations, and WTP contractual requirements, and do not introduce inconsistencies with Top-Level Standards or conflict with other authorization basis requirements. Attached is the Safety Evaluation Report.

If you have any questions, please contact me, or your staff may contact L. F. Miller, Jr., Office of Safety Regulation, (509) 376-6817.

Sincerely,

Roy J. Schepens
Manager

OSR:RWG

Attachment

**Safety Evaluation Report (SER)
of Proposed Authorization Basis Change Notice
24590-WTP-ABCN-ESH-02-018, Revision 0
for the River Protection Project – Waste Treatment Plant (RPP-WTP)**

1.0 INTRODUCTION

Bechtel National, Inc. (BNI) is the Contractor for the RPP-WTP under Contract No. DE-AC27-01RV14136 between the U. S. Department of Energy (DOE) and BNI. The RPP-WTP authorization basis (AB) is the composite of information, provided by the Contractor in response to radiological, nuclear, and process safety requirements, that is the basis on which the Office of River Protection Manager grants permission to perform regulated activities. The AB includes that information requested by the Contractor for inclusion in the AB and subsequently accepted by the DOE. The AB for the RPP-WTP includes the Safety Requirements Document (SRD)[1] that provides the Contractor-derived and DOE-approved radiological, nuclear, and process safety objectives and criteria applicable to the design, construction, acceptance testing, maintenance, operation, and deactivation and decommissioning of the RPP-WTP. Sections 4.4 and 5.3 of the SRD contain safety criteria for the design of HVAC and offgas ventilation systems. Currently, the identified implementing standards for these safety criteria are:

ASME AG-1-1997, *Code on Nuclear Air and Gas Treatment*
ASME N509-89, *Nuclear Power Plant Air Cleaning Units and Components*
ASME N510-1989 (Rev 1995), *Testing of Nuclear Air Cleaning Systems*
NFPA 801-95, *Standard for Facilities Handling Radioactive Materials* (SC 4.4-8 only).

2.0 BACKGROUND

ABCN 24590-WTP-ABCN-ESH-02-018, Revision 0, was reviewed against the Office of Safety Regulation Management Directive 3.4, "Processing Authorization Basis Amendment Requests,"[2] to ensure the following:

- Changes to the AB (SRD) did not adversely affect the health and safety of the public or workers;
- Changes to the SRD were consistent with applicable laws, regulations, and RPP-WTP contractual requirements;
- Changes to the SRD did not introduce inconsistencies with Top-Level Standards or conflict with other AB documents.

[1] BNI Document 24590-WTP-ESH-SRD-01-001-02, *Safety Requirements Document*, Volume II, Revision 1, dated June 6, 2002.
[2] RL/REG-97-05, *Office of Safety Regulation Management Directive 3.4*, "Processing Authorization Basis Amendment Requests," Revision 1, dated January 25, 2001.

This SER documents the results of the review of ABCN 24590-WTP-ABCN-ESH-02-018, Revision 0, including the associated proposed revisions to the SRD.

3.0 EVALUATION

The proposed changes to the SRD are as follows:

1. Revise Safety Criteria 4.4-6, 4.4-7, 4.4-8, 5.3-4, and 5.3-5 to include ASME B31.3-1996, Process Piping, within the list of Implementing Codes and Standards.

2. Include a new Section X.0, entitled "ASME B31.3-1996, *Process Piping*," to Appendix C, *Implementing Standards*. (The X in the section number will be replaced by the appropriate number based on the sequence of approved tailoring of standards.)

   The proposed tailoring of ASME B31.3-1996 for use as an implementing standard for Safety Criteria 4.4-6, 4.4-7, 4.4-8, 5.3-4, and 5.3-5 is to limit the standard to the fabrication and installation of those portions of the C5 ventilation system (C5V) ductwork that are embedded in concrete. Specifically, the use of ASME B31.3-1996 in this application is limited to Chapter 3, *Materials*; Chapter 5, *Fabrication*; and, Table 341.3.2, *Visual Acceptance Criteria for Category D Fluid Service Piping*. Air Testing requirements for this ductwork are not affected by this proposed change and are still required to be compliant with ASME AG-1.

The justification for this change provided by BNI is that, due to wall thickness requirements of ductwork embedded in concrete, piping materials are required. Specifically, ASME AG-1 fabrication standards are limited to a duct wall thickness of 0.188 inches, while the wall thickness required for fabrication of ductwork embedded in concrete is required to be 0.375 inches.

DOE reviewers evaluated ABCN 24590-WTP-ABCN-ESH-02-018, Revision 0 against the requirements of ASME AG-1 and ASME B31.3. Relevant sections of ASME AG-1 are Section SA, *Ductwork*, Article SA-3000, *Materials*, Subarticle SA-3400, *Material Specifications*, and Table SA-3400-1. Specifically, Subarticle SA-3400 states: "The ASTM numbers in Table SA-3400-1 designate a chemical composition and a material thickness limit." Table SA-3400-1 references ASTM A666, *Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar*; which BNI has determined to be the applicable materials standard for the C5V ductwork. Table 3 on page 5 of ASTM A666 provides a list of properties for this austenitic stainless steel for various configurations. The right-hand column of the table identifies maximum material thickness and includes values from 0.05 inches to 0.1874 inches.

BNI performed structural analysis which indicated that embedded austenitic stainless steel ductwork requires a wall thickness of approximately 0.375 inches to be able to withstand the loads imposed by three feet of concrete placed on top of the ductwork. As such, the structural

requirements for the ductwork exceed the thickness limits addressed by ASME AG-1 and its referenced ASTM standard (A666).

4.0 CONCLUSIONS

The reviewers determined that ASME AG-1 and its referenced ASTM standard (A666) do not contain adequate materials and fabrication requirements for the embedded C5V ductwork. Further, the reviewers determined that ASME B31.3 is an adequate code for determining the materials, fabrication, and visual acceptance criteria for the embedded C5V ductwork. As such, the reviewers concluded the SRD changes proposed by ABCN 24590-WTP-ABCN-ESH-02-018, Revision 0 are appropriate. Specifically, the reviewers determined the addition of ASME B31.3-1996 as an implementing code for SRD Safety Criteria 4.4-6, 4.4-7, 4.4-8, 5.3-4, and 5.3-5 to be appropriate. In addition, the tailoring of ASME B31.3-1996 in Appendix C of the SRD that limits the applicability of the code to Chapters 3 and 5 and Table 341.3.2 was determined to be appropriate because the testing requirements for the embedded C5V ductwork are still required to meet the requirements of ASME AG-1.

On the basis of the considerations described above, the ORP has concluded that there is reasonable assurance that the health and safety of the public and the workers will not be adversely affected by the proposed ABCN changes, and that they comply with applicable laws, regulations, and RPP-WTP contractual requirements. Therefore, ABCN 24590-WTP-ABCN-ESH-02-018, Revision 0 and the associated revisions to the SRD are approved.